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1967

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THE FOCAL LIBRARY

The Focal Library is a notable publishing undertaking which reports international progress in photographic science and technology. The studies, symposia, research monographs, and manuals in The Focal Library are designed for scientists and engineers in the fields of photography, cinematography, and sound and image recording. They are written by leading authorities in these fields under the guidance of the Editorial Board, and published in the United States by Focal Press, Inc., 20 East 46 Street, New York, N.Y. 10017.

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NEW

The Chemistry of Photographic Mechanisms

K. S. Lyalikov, Leningrad Institute of Ciné Engineers

K. S. Lyalikov's work is a classic of Russian scientific literature and is used as a basis of Soviet university courses on the subject. Because the roots of Soviet science grew independently from Western influences, this work is exceptionally valuable to the serious Western student in its comparative and complementary function. It presents a coherent and eminently readable account of the fundamental chemistry of various processes which take place during the preparation, use, and processing of silver-halide photographic materials. The theory is well illustrated with experimental data in 40 tables and 122 figures.

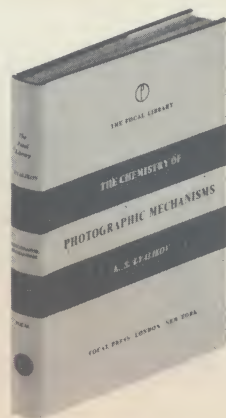
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PHOTOCHEMISTRY OF SILVER-HALIDE LAYERS. The Photochemistry of Light-Sensitive Layers Containing Silver Halide. The Photographic Action of Nuclear Particles. THEORY OF DEVELOPMENT. Development as an Oxidation-Reduction Process. The Chemistry of Developing Agents. The Secondary Reactions Taking Place During Development. Color Development. The Kinetics of Development. Special Development Phenomena. The Mechanism of the Development Process. THE CHEMISTRY OF THE PROCESSES OF THE SECONDARY PROCESSING OF PHOTOGRAPHIC LAYERS. Fixation. Intensification, Reduction, Toning and Washing. THE THEORY OF THE FORMATION OF A PHOTOGRAPHIC EMULSION. A Photographic Emulsion as a Colloidal System. The Formation of a Photographic Emulsion as a Particular Case of the Formation of a Colloidal System. Stages in the Recrystallization of Silver Halide. The Connection Between the Granulometric and the Sensitometric Properties of Emulsions. The Theory of the Chemical Sensitization of Photographic Emulsion. The Stabilization of an Emulsion. The Spectral Sensitization of Photographic Emulsions. Literature References. Author Index. Subject Index.

1967

355 pages

\$38.00



NEW

Color Photography in Practice

D. A. Spencer, Deputy Chairman, Kodak Ltd.; edited by L. A. Mannheim, Consultant in Photography and principal technical editor of THE FOCAL ENCYCLOPEDIA OF PHOTOGRAPHY; and by Lt. Col. The Viscount Hanworth, contributor to the field for nearly 20 years.

Completely revised and up-dated, this 28-year-old classic continues to offer the professional and advanced amateur the most comprehensive examination available of the technical uses of color photography materials. From the fundamentals of color through press-printed publications, *Color Photography in Practice* provides a broad foundation of information and theory adaptable to all commercially available systems. The theory included facilitates comprehension of the practical explanations without going into the most complex realms. Thus the book combines the best elements of a basic text with a practical reference and guide. Line drawings and half-tones.

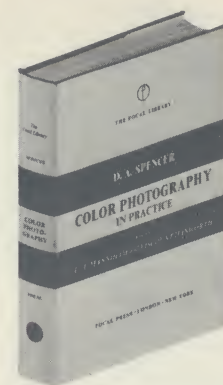
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FUNDAMENTALS OF COLOR AND PHOTOGRAPHY. Light and Color. The Eye and Color Vision. Fundamentals of Color Photography. Lighting for Color Photography. Exposure. COLOR PROCESSES AND TECHNIQUES. Reversal Color Films. Negative-Positive Color Materials. Processing Color Materials. Printing and Duplicating Transparencies. Making Separation Negatives. Development of Separation Negatives. Assembly Color Print Processes. ACCURATE COLOR REPRODUCTION. Densitometry. Masking and Color Correction. Color Photographs in Print. Aesthetic Considerations. APPENDIX A: Glossary of Technical Terms. APPENDIX B: Glossary of Color Processes. APPENDIX C: Tabulated Reference Data. APPENDIX D: Further Reading.

1966

410 pages

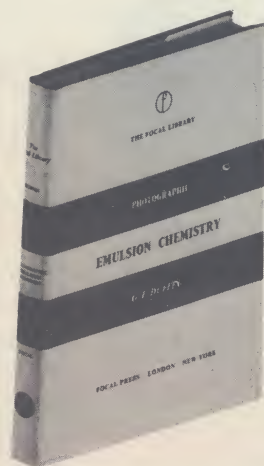
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NEW

Photographic Emulsion Chemistry

G. F. Duffin, Managing Director of Research,
3M Research, Harlow, England



The first comprehensive study of the chemistry behind today's silver halide photographic materials, this book is designed to present a clear, interrelated explanation of this complex subject. Photography students and scientists in the photographic industry will find here a logical, step-by-step discussion of the preparation of products, illustrated with typical formulae. From raw materials, through the various stages, to color and some non-conventional processes, *Photographic Emulsion Chemistry* provides a thorough, up-to-date foundation for further study. Enough theory is supplied to explain practices in detail, so that only a minimal amount of chemical background is necessary. Line drawings and photographs.

CONTENTS

Silver Halides. Gelatin. Photographic Base Materials. Emulsion Preparation. Chemical Sensitization. Spectral Sensitization. Stabilizers and Anti-Foggants. Coating. Latent Image. Color Processes. Non-Conventional Processes. Author Index. Subject Index.

1966

239 pages

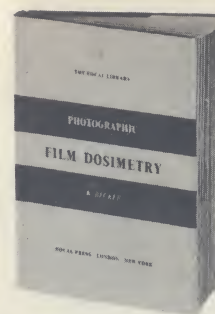
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The Focal Encyclopedia of Photography is the outstanding source of all photographic knowledge. (See page 20)

NEW

Photographic Film Dosimetry

Klaus Becker, Head of Personnel, Dosimetry Section, Health Physics Division, Julich Nuclear Research Establishment, West Germany



This work is devoted to the scientific background and the practical application of the most widespread method in personnel radiation dosimetry. It is the first comprehensive review of photographic radiation measurement principles and techniques, and is based on extensive studies in this field. The bibliography of about 1,000 titles covers the field almost completely up to early 1965.

INTRODUCTION. Definitions and Comparison with Non-Photographic Methods. Historical Survey. PHYSICAL AND CHEMICAL PRINCIPLES OF FILM DOSIMETRY. Radiation and Dose. Formation of Photographic Density. FILM DOSIMETRY OF HIGH-ENERGY QUANTUM RADIATION. Effect of Different Quantum Energies. Time Distribution of Exposure. Energy Dependence of Sensitivity. Combinations of Film and Filter. FILM DOSIMETRY OF NEUTRONS. Effect of Neutrons on Conventional Emulsions. Practical Dosimetry of Thermal Neutrons. Practical Dosimetry of Fast Neutrons. Methods for Nuclear Track Counting. FILM DOSIMETRY OF BETA RAYS, MIXED RADIATION FIELDS AND SPECIAL APPLICATIONS. Beta Radiation Dosimetry. Mixed Radiation Fields. Special Applications. PRACTICAL FILM DOSIMETRY. Film Sensitivity and Range of Measurement. Film Wrapping and Identification. Badge Design. Organization and Laboratory Technique. Results and Their Interpretation. Bibliography. Author Index. Subject Index.

1966

223 pages

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NEW

Photographic Processing Chemistry

L. F. A. Mason, Head of the Processing Section, Basic Research Laboratories, Ilford Ltd.

Until now, contemporary photographic literature has provided only limited discussions of the chemistry of processing within general photographic chemistry texts. With the publication of *Photographic Processing Chemistry* the manufacturer and user of photographic processing materials has a complete guide to the chemistry and techniques of controlled photographic processing. Broad in scope, it covers the chemistry of processing solutions for both color and black-and-white materials. Unusually detailed explanations of new and standard techniques are developed against a background of basic theory. A cross-referenced appendix on A. S. A. specifications for chemicals and an appendix on materials for equipment round out this comprehensive text and reference book.

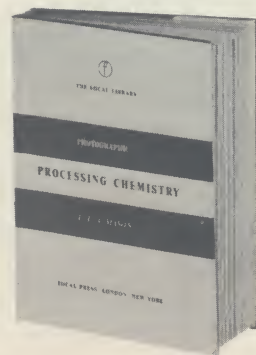
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The Photographic Developer: General Considerations. The Photographic Developer: Purity of Chemicals and Water. The Photographic Developer: The Chemistry of the Developing Agents. The Photographic Developer: Mechanism of Development. The Photographic Developer: Practical Considerations and Formulae. Fixation and Stabilization. Washing, Drying and Other Processing Stages. Color Processing: The Color Development Reaction. Color Processing: Processes Based on the Normal Color Development Reaction. Color Processing: Processes Not Based on the Normal Color Development Reaction. Appendixes. Indexes.

1966

321 pages

\$15.00



NEW

Radiographic Processing In Medicine and Industry

D. H. O. John, Editor of PHOTOGRAPHIC ABSTRACTS (Royal Photographic Society)

Because of today's minor revolution in methods of processing X-ray films anyone concerned with radiographic processing will find this authoritative survey of all available knowledge on the subject invaluable to a more profound understanding of current advances. The first comprehensive and totally up-to-date presentation, it examines each stage involved in the preparation of high quality radiographs. From the design and construction of darkrooms and their equipment, through the materials and processes of each stage, to a final discussion of frequent faults arising in darkrooms, extensive practical explanations clarify the nature of both manual and automatic processing. Rounding out these discussions are both the necessary amount of theoretical background and examples from the author's experiments in Great Britain, Europe, and the United States over the past 16 years. A unique and comprehensive collection of over 500 references to original literature and a formulary complete this profound reference work.

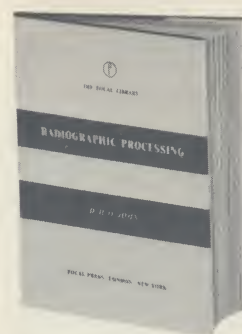
CONTENTS

Darkroom Design and Construction. Darkroom Equipment and Procedure. Sensitive Materials and Screens. Processing, Its Theoretical Background. The Developer, Its Nature and Use. The Developer, Its Regeneration. The Fixer, Its Nature and Use. The Fixer, Its Regeneration. Washing and Drying. Rapid Processing Methods. Tropical Processing Methods. Special Processing Methods. Properties of the Developed Image. Shortcomings of the Developed Image. Appendixes. Subject Index. Author Index.

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FORTHCOMING

Color Measurement

Hans Arens

A clear and thorough discussion of the basics of colorimetry, this book provides an excellent introduction to this large and complicated field. Beginning with the general properties of color, Dr. Arens considers both the psychological approach to colors and color in terms of the stimulus. He then defines the fundamentals, systems of measurement, and data-determining apparatus of colorimetry. He finishes his discussion of color measurement with an analysis of psychological color measurement and the relationship between colorimetric and psychological specification. *Colorimetry* includes the DIN color chart, a list of references, and a table of common terms.

Fall 1967 78 pages \$14.50

Orders placed now for this book will be filled upon publication.

Generation of Optical Surfaces

Edited by K. G. Kumanin

This volume provides the first extensive theoretical examination of the processes involved in the technological problems of manufacturing optical surfaces. Written by members of Dr. Kumanin's laboratory group, the papers are based on theoretical and practical studies and experience. Some are heavily mathematical. The first section of the book presents experimental data on the grinding processes, including ultrasonic methods of polishing. Part Two considers the problems of working plane, spherical and aspherical surfaces, and discusses the use of new equipment. The last section treats the theoretical problems connected with the generation of optical surfaces by abrasive machining.

Fall 1967 460 pages \$45.00

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FORTHCOMING

Manual of Oscillography

Howard W. Hoadley

A comprehensive and thorough report on the current state of oscillography, this manual provides the history, theory and reference data necessary to a complete understanding of contemporary progress in the field. In particular, it emphasizes photo-oscillography (as exemplified in light-beam and electron-beam recorders), describing it from transducer to oscillogram. This state-of-the-art survey covers recorders, transducers and accessories, materials, processors, readers, and support equipment. The information reflects current models, materials, and methods, and the descriptive product information is based on data furnished and subsequently reviewed by manufacturers.

Fall 1967 344 pages \$28.00

Orders placed now for this book will be filled upon publication.

Photographic Science Symposium: Paris 1965

Edited by J. Pouradier

The papers read at the Paris International Conference represented an unusually wide coverage of the field of photography. Current research and work in most fields of photographic science were reported—from photographic gelatin and emulsions through the latent image and its investigation to studies of the processing, evaluation, and use of the final visible image. Treatment of silver systems was particularly complete. Also included were studies of non-silver processes and the chemical nature of dye sensitizers. Succinct, informative discussions follow each paper.

Fall 1967 640 pages multi-lingual \$44.00

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(See inside back cover for the complete set of Focal Library volumes on the international conferences on photographic science.)

Problems in Photographic Research and Technology

N. I. Kirillov

The intensive discussions of key photographic problems in this volume convey a basic idea of the origins of the problems, report on progress achieved in dealing with them, and forecast further developments in photography related to them. The first chapter is devoted to photographic sensitivity in its general scientific and technical aspect. Chapter Two reviews the process of developing under various conditions and the functions, influences, and formulae of the constituents of developers. In the third chapter the author deals with rapid and ultra-rapid processing of photographic layers. Finally, he considers continuous processes for the synthesis of photographic emulsions, and the possibilities of creating automatic technological lines for the routine mass printing of black-and-white films. Illustrated with numerous line drawings.

Fall 1967 224 pages \$30.00

Orders placed now for this book will be filled upon publication.

Thin Films in Optics

H. Anders

Mainly devoted to a description of the importance and application of thin films, this book begins with a complete theoretical development of a phenomenological system based on the well known Fresnel formulae. Thus the optical consequences of thin films are explained, followed by experimental results again evidencing the importance of thin film systems in technical optics. The final section reviews the procedures and methods for the production of thin films and briefly traces their historical developments. The text is complemented by over 90 illustrations and several color plates. There is an extremely comprehensive bibliography.

Fall 1967 192 pages \$22.50

Orders placed now for this book will be filled upon publication.

High-Speed Photography

Raymond F. Saxe, Professor of Nuclear Engineering, North Carolina State of the University of North Carolina at Raleigh

"...this highly concentrated monograph is a very readable and enjoyable book and is recommended to all seeking a good guide to fundamental facts of high-speed photography." **SPSE News**

This book deals with high-speed cine cameras, with streak and framing cameras and with single-shot, short-exposure picture-taking devices. Chapters on light sources and on techniques for the examination of fluid flow phenomena are included. A chapter on flash X-ray techniques describes the methods by which short bursts of X-rays are generated. A chapter on electronics gives a very general introduction to some of the techniques used both in making some of the above high-speed photographic methods possible, and in monitoring the results of others. The examples of equipment, etc. illustrate the performance which can be expected of commercially available equipment. Examples in the text indicate the approximate limits in specific cases of "custom-built" equipment and the reasons for these limits.

1966 137 pages \$15.00

Physical Optics in Photography

Georg Franke, at Ernst Leitz, Wetzlar, and Professor of Applied Optics at the University of Giessen

"...interesting by its treatment of the image formation according to the modern concept of the contrast transfer function and, because of this feature, it will be found by many photographic engineers indispensable." **SPSE News**

A careful and distinctive presentation of knowledge basic to the design and assessment of optical systems, this book is particularly useful to the reader concerned with the increasing range of applications of photographic lenses. Starting with the theory of perfect image formation, Dr. Franke thoroughly considers the problems of the aberrated image. He goes on to give a complete classification of optical systems, and concludes with a survey of up-to-date methods of testing and assessing photographic lenses. This last section and the bibliography offer an especially useful guide to the post-war German contribution to the subject. There are over 100 illustrations.

1966 218 pages \$20.00

Practical Photomicrography

J. Bergner, physicist; E. Gelbke, precision engineer; and W. Mehliß, optical expert; all with the Laboratory for Technical Microscopy of Carl Zeiss, Jena, East Germany

Practical Photomicrography offers the photographer and the laboratory worker a basic handbook of information on the photomicrographic instrument. It covers the theoretical aspects of the instrument and demonstrates its most practical applications. Every modern technique is fully explained and special techniques (schlieren, phase contrast, infra-red, ultra-violet, and others) are discussed in great detail. The sections on electronic flash and stereoscopic photomicrography are of particular interest. The final chapter gives practical hints for exposure and photography. A concluding bibliography lists general and specialized books and papers on the subject and is followed by a selection of tables of great practical value. Fully illustrated with diagrams and photographs, a number of them in color.

1966 228 pages \$17.00

Stereoscopy

N. A. Valyus, Chair of Physics, All-Union Institute of Machine Construction, Moscow, and Lecturer, M. V. Lomonosov, State University, Moscow

"This book is most welcome because it brings to the attention of the American scientist a considerable portion of the work done in Russia in the field of stereoscopy. . . it will be of interest to both the beginner making his first acquaintance with stereoscopy and to the experienced worker who wishes to extend his work to three-dimensional image formation." **SPSE-NY Bulletin**

Probably the most comprehensive and thorough coverage of basic technology and applications, *Stereoscopy* examines: principal factors of binocular vision; chief means of forming and viewing spatial images; raster separation of stereoscopic images; stereoscopic photography, prints, cinematography, and television; uses of stereoscopy for measurements and cartography; methods of three-dimensional pictorial art; and metrics of stereoscopic reproduction. The book contains nearly 250 illustrations, together with more than 30 three-dimensional plates. (An anaglyphic viewer is attached to the binding.)

1966 426 pages \$39.00

Chemical Analysis in Photography

G. Russell, formerly Minnesota 3M Research Ltd. and Ilford Ltd., now British Glues and Chemicals Ltd.

"This book is intended as a technician's guide to analytical methods of use in the photographic industry. It is all that and more. Besides giving well tested procedures that are detailed enough for direct use, there are many references and suggestions for people who want to explore and develop newer procedures. . . Anyone involved with analysis of photographic materials is indebted to Russell for sharing his wide knowledge and experience in this field."

Journal of the SMPTE

1965 272 pages \$18.75

General Sensitometry

Yu N. Gorokhovskii, Chair of General Photography and Technology, and T. M. Levenberg; both Leningrad Institute of Motion Picture Engineers

". . . this book is without doubt the most comprehensive yet published on the subject . . . As a source book this would be a useful addition to any library that strives for completeness in photography." **Journal of the SMPTE.**

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SPSE-NY Bulletin

1965 303 pages \$27.50

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R. M. Schaffert, Senior Physicist, IBM Systems Development Division, San Jose

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1965 463 pages \$38.00

Xerography and Related Processes

Edited by J. H. Dessauer, Executive Vice President of Xerox Corporation, in charge of Research and Engineering. H. E. Clark, Technical Editor of this book, is Scientific Director of Xerox Corporation

Written by members of the research and engineering staffs of Xerox Corporation and Battelle Memorial Institute where the electrophotographic processes and material were developed.

"Not only are the chapters excellent summaries of what has often previously only appeared in the patent literature, but they are also vehicles for carrying material that has never been published anywhere . . . The volume is excellently illustrated and well edited . . ." **Photographic Science and Engineering.**

1965 520 pages \$38.00

Basic Photography

M. J. Langford, School of Photography, Birmingham College of Arts and Crafts, Birmingham, England

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1965 374 pages \$10.75

Photography on Expeditions

D. H. O. John, Ilford, Ltd., England, and member of the Scientific and Technological Group of the Royal Photographic Society, Editor of PHOTOGRAPHIC ABSTRACTS

"Preparations, precautions, problems and practices in photographic activity under the unconventional conditions required in exploration are covered in fairly exhaustive and eminently practical detail . . . a practical manual that should be invaluable to the novice, as well as to experienced photographers."

The New York Times

1965 176 pages \$12.50

Spectral Studies of the Photographic Process

Yu. N. Gorokhovskii, Chair of General Photography and Technology, Leningrad Institute of Motion Picture Engineers

"...the most comprehensive survey of the field published so far...an excellent addition to the photographic science literature...serious students with an interest in spectral properties of photographic materials are encouraged to examine this book."

SPSE News

1965 357 pages \$27.50

Measurement of Optical Radiations

Georg Bauer, Head of the Department of Optics, the Federal Institute of Physical Technology, Braunschweig, Germany

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SPSE News

1965 134 pages \$12.50

Photographic Gelatin

R. J. Croome, Chief Photographic Chemist, and F. G. Clegg, Director of the Photographic Division; both P. Leiner and Sons, Ltd., England

"... a valuable addition to photographic literature, familiarizing us with some of the otherwise not easily accessible problems of gelatin manufacture."

SPSE News

1965 95 pages \$12.50

A System of Optical Design

Arthur Cox, Vice President, Photo Products Group, Bell and Howell, Chicago

"I have the greatest admiration for this book... Many great designers have learned this material and used it with understanding, but few have also been able to write about it. Cox has done both. Workers in this field owe him a vote of thanks."

Applied Optics

1964 660 pages \$55.00

Making and Coating Photographic Emulsions

V. L. Zelikman and S. M. Levi, both of the Institute for Physical Chemistry, U.S.S.R. Academy of Science

"... a readable and well-balanced synthesis of the widely scattered and difficult literature on the basic principles of this field."

David L. MacAdam, *Journal of the Optical Society of America*

1964 311 pages \$23.00

Fourier Methods in Optical Image Evaluation

E. H. Linfoot, University of Cambridge

"... this book should be in every laboratory within its field."

Photographic Science and Engineering

1964 96 pages \$10.00

Film Coating Theory

B. V. Deryagin and S. M. Levi, both of the Institute for Physical Chemistry, U.S.S.R. Academy of Science

"This remarkable contribution, which is translated from Russian, offers an unusual opportunity to compare coating technology theories."

Photographic Science and Engineering

1964 192 pages \$23.00

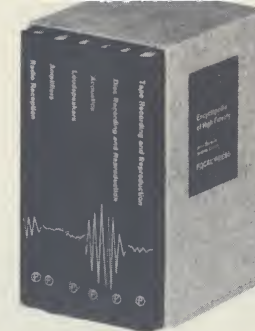
Microcopying Methods

H. R. Verry, Chairman of the Education Committee of Britain's Institute of Reprographic Technology, and former Consultant on Documentation for the Organization and Methods Division of the British Treasury

"... a basic guide to all current microcopying processing—covering roll films and the unitized methods to rapid selector devices ... designed to show executives how to evaluate, select and use the most efficient microfilm system for their special needs."

Systems

1964 176 pages \$10.50



Encyclopedia of High Fidelity

Edited by John Borwick

Six volumes—specially boxed—provide a complete reference library on the reproduction of sound. Each volume, written by an expert on one aspect of the high fidelity field, presents basic theory, describes equipment and its use, and discusses practical techniques. All six books are fully illustrated with diagrams, photographs, and tables, and include indexes and glossaries.

\$49.00 boxed set; \$9.50 each.

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H. Lewis York Covers the theory of tube and transistor amplification, basic circuit elements, special requirements for high-fidelity amplifiers. Describes all types of amplifiers and gives clear circuit diagrams and full details of components. Shows how to design and construct amplifiers ranging from 3 to 1000 watts.

256 pages, 180 diagrams.

ACOUSTICS

G. W. Mackenzie Explores how sound sources work, how sounds travel and how our ears hear them. Characteristics of noise, speech, musical notes. How sounds behave in a room—echoes, reverberation, reflection, absorption, resonance. Final chapter on microphones.

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DISC RECORDING AND REPRODUCTION

P. J. Guy Opens with the basic theory of sound, microphones, disc recording and reproducing systems and continues with detailed descriptions of all the separate units. Takes in coarse and fine groove systems, equalization problems, frequency response measurement, playing speeds and stereophony.

232 pages, 214 diagrams.

TAPE RECORDING AND REPRODUCTION

A. A. McWilliams Treats every stage of magnetic tape recording and replay, starting with the tape itself and ending with descriptions of all the current uses of tape recorders in education, entertainment, commerce, science and industry.

288 pages, 256 diagrams.

RADIO RECEPTION

H. Henderson Discusses all the essential theoretical background of radio transmission and reception and the functions of valves and transistors in radio circuits. Describes all the basic components and their characteristics.

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LOUDSPEAKERS

E. J. Jordan Covers the basic principles of loudspeaker design and performance and describes the construction and manufacture of loudspeakers. Describes all types of speaker enclosure, special requirements for stereo and P.A., effect of room acoustics and speaker placement.

228 pages, 123 diagrams.

The Focal Encyclopedia of Photography

COMPLETELY REVISED

the authoritative source
of ALL photographic knowledge



"Here is a tripartite work which acts as a dictionary of terms, an encyclopedia of both artistic theory and scientific history, and a practical text where an entry such as 'Abstract Photography' gives the reader the history of the subject, an aesthetic comparison to painting, and various technically detailed methods whereby an abstract photograph can be created by an amateur. This doubling in brass (a reference book *cum* how-to-do-it text) is highly successful since the facts can be trusted and the explanations and directions are forthright, clear and inclusive. Of importance here is a guide to 15 subject divisions under each of which are listed every major and minor entry in the encyclopedia having any relationship to the topic at hand. Thus the work retains its alphabetical listing while at the same time affording the reader easy access to all materials available on his chosen subject. This second edition has been substantially enlarged by additional text and illustrative material. . . . I have nothing but praise for this work, with its beautiful illustrations, bibliographies and cross references . . . it is worth shelves of the usual photographic manuals."

Library Journal

The only work of its kind, *The Focal Encyclopedia* encompasses a complete photographic library within its two volumes. This Revised Edition is the authoritative source of photographic knowledge, both theoretical and practical, for professional and amateur, technician and scientist, advanced and beginner alike. Its coverage has been expanded to a million and three-quarter words; its pages to 1,755, to include all of the many advances that have been made in photographic science and technology since the First Edition was published in 1956. Advised by 55 specialists, the Focal Press editorial team assembled, checked and coordinated 2,400 articles contributed by 281 authorities from 28 countries. Diagrammatic illustrations were increased to 1,750, photographs to 450, including 16 in full color.

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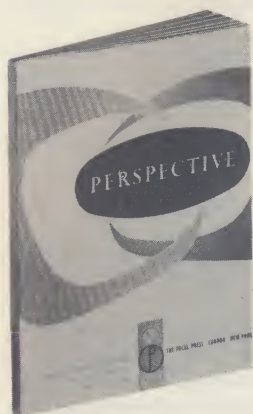
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